

JBIG DECODING SECTION STORING JBIG CODING SECTION MEMORY 108 <u>ප</u> වි BIT MAP DATA BT 1bit BLOCK DATA RESTORING SECTION FREQUENCY BANDING SECTION SECOND LINE MEMORY THIRD LINE AEMORY G33:0] 32bit F331:0] 32bit 105 FREQUENCY DATA RESTORING SECTION BLOCK DATA GENERATING SECTION AC HIGH FREQUENCY
COMPONENT
DA(15:0)
16bit AC LOW FREQUENCY COMPONENT AC LOW FREQUENCY COMPONENT AC HIGH FREQUENCY COMPONENT QA[15:0] **蒙 QUANTIZING SECTION** INVERSE QUANTIZING SECTION HAAR COEFFICIENT HB00[7:0] HB33[7:0] 16 × 8bit HAAR COEFFICIENT HADQ[7:0] HA33[7:0] 16 × 8bit 50 INVERSE HAAR TRANSFORM SECTION HAAR TRANSFORM SECTION BLOCK DATA DD0[7:0] 033[7:0] 16 × 8bit BLOCK DATA PC0[7:0] R33[7:0] 16 × 8bit <u>ජ</u> 15 FOURTH LINE MEMORY BLOCK DIVIDING COMBINIC FIRST Line Memory 쯣 167 蒙 急

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PRIMARY PATTERN(Pmnxy)

z = u $\epsilon = u$ $\iota = \mathsf{u}$ P02 P03 P12 P13 P22 P23 P32 P33 P03 P12 P13 m = 3 m = 2P20 P21 P22 P23 P20 P21 P22 P23 P20 P21 POG POT PO2 PO3 POU POT PO2 PO3 PO0 POT P10 P11 P12 P13 P10 P11 P12 P13 P10 P11 P36 P31 P32 P33 P30 P31 P32 P33 P36 P31 P02 P03 P00 P01 P02 P03 P00 P01 910 P11 P12 P13 P10 P11 P12 P13 P10 P11 P20 P21 P22 P23 P20 P21 P22 P23 P20 P21 P30 P31 P32 P33 P30 P31 P32 P33 P30 P31 - | m = 0 P00 | P01 | (MN ARE OMITTED IN THE FIGURE) Pmnxy = -1 Pmnxy = 1

FIG. 4

0 = u

P12 PT3

P02 P03

P00 P01 P02 P03 P00 P01 P02 P03 P00 P01 P10 P11 P12 P13 P10 P11

P22 P23

P20 P21 P22 P23 P20 P21 P22 P23 P20 P21

P32 P33 P30 P31 P32 P33 P30 P31

P30 P31

P32 P33

HA03	HA13	HA23	HA33
(AC600dpi	(AC600dpi	(AC600dpi	(AC600dpi
COMPONENT)	COMPONENT)	COMPONENT)	COMPONENT)
HA02	HA12	HA22	HA32
(AC600dpi	(AC600dpi	(AC600dpi	(AC600dpi
COMPONENT)	COMPONENT)	COMPONENT)	COMPONENT)
HA01	HA11	HA21	HA31
(AC300dpi	(AC300dpi	(AC600dpi	(AC600dpi
COMPONENT)	COMPONENT)	COMPONENT)	COMPONENT)
HA00	HA10	HA20	HA30
(DC	(AC300dpi	(AC600dpi	(AC600dpi
COMPONENT)	COMPONENT)	COMPONENT)	COMPONENT)

FIG. 5

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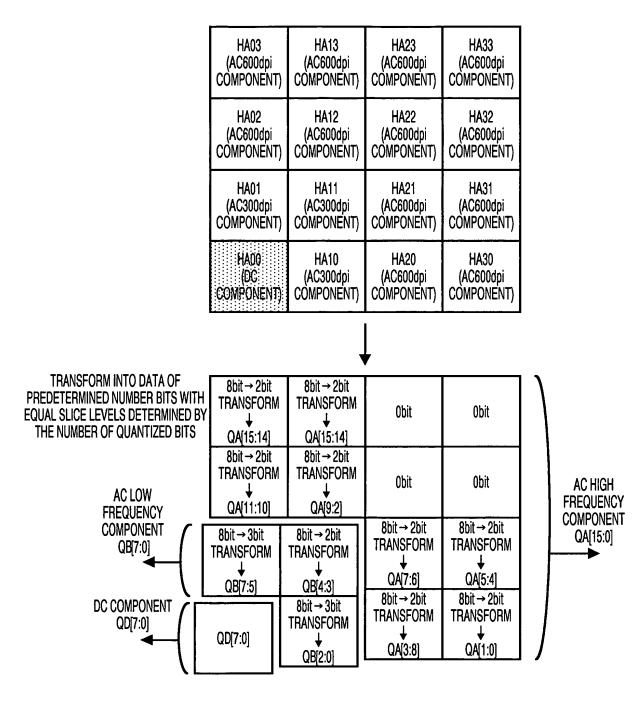
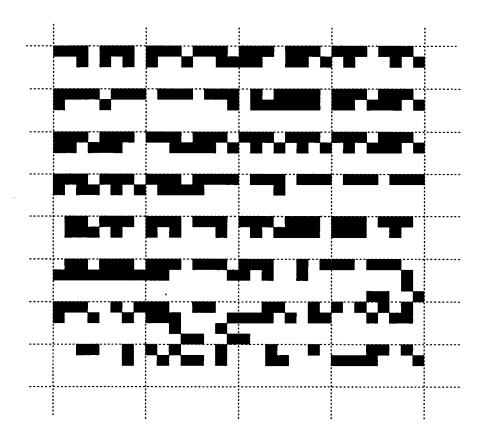


FIG. 6

F20 [3]	F20 [11]	F20 [19]	F20 [27]	F21 [3]	F21 [11]	F21 [19]	F21 [27]	F22 [3]	F22 [11]	
F20 [4]	F20 [12]	F20 [20]	F20 [28]	F21 [4]	F21 [12]	F21 [20]	F21 [28]	F22 [4]	F22 [12]	
F20 [5]	F20 [13]	F20 [21]	F20 [29]	F2] [5]	F21 [13]	F21 [21]	F21 [29]		F22 [13]	
F20 [6]	F20 [14]	F20 [22]	F20 [30]	F21 [6]	F21 [14]	F21 [22]	F21 [30]	F22 [6]	F22 [14]	
F20 [7]	F20 [15]	F20 [23]		F2] [7]		F21 [23]	F21 [31]	F22 [7]	F22 [15]	
F10	F10 [8]	F10 [16]	F10 [24]	F113		F11 [16]			F12 [8]	
F10		F10 [17]	F10 [25]			F11 [17]		F12	F12 [9]	
F10 [2]	F10 [10]	F10 [18]		[2]		F11 [18]	F11 [26]	F12 [2]	F12 [10]	
0 F10 J [3]	F10 [11]	F10 [19]	F10 [27]	F11	F11 [11]	F11 [19]	F11 [27]	F12 [3]	F12 [11]	
F10 [4]	F10 [12]	F10 [20]		[4]		F11 [20]	F11 [28]	F12 [4]	F12 [12]	
F10	F10 [13]	F10 [21]	F10 [29]	F11	F11 [13]	F11 [21]	F11 [29]	F12 [5]	F12 [13]	
F10	F10 [14]			F1.	F11 [14]	F11 [22]	F11 [30]		F12 [14]	
F10		F10 [23] [F10 31] [F11	F11 [1 [15] [F11 [1	F11 [F12 [7]	F12 [15] [
F00	F00 [8] [[F03				F02	F02 [8] [
F00	F00 1	F00 [$\overline{}$	F01		F01 [1		F02 [1	F02 [
F00 1		F00 [1		F01 [2]	_	F01 [F		F02 1	F02 F	
55.E		F00 F		F01 [3]		F01 [F		F02	F02 F [11] [[
	F00 [F		F00 F [28]			F01 [F	F01 F [28] [.,.,.	F02 F	
	F00 F			<u> </u>		F01 F [21] [F01 F [29] [F02 F [13][[
88	.00 14] [.00 22] [30] F	69	01 F 14] [.01 F 22] [5	.01 30] [02 6] [.02 F 14] [
7]	.00 15] [2	.00 F 23][E	F00 F00 [31] [30]	701	01 15] [5	.01 F 23] [5	.01 F 31][[5	02 F 7] [1	02 F 15][[
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1	1	4		↑	↑	4		•		
ا غ	- tie) P: E:		夢	æit –	÷				
NEN!		NENT.		NEN!	SEN	VENT				
DC COMPONENT 8bit	SOMP	OMPO		DC COMPONENT 8bit -	COMP	OMPO				
2	ac Low Frequency Component 8bit -	A DUICH COEDITION ON BONIENT 4644	<i>></i>	ള	AC LOW FREQUENCY COMPONENT 8bit	2	אלי הומח דחבעלבועלו לסואורטייבוען וסטור			
		אר איני היו	ובער. ה			בווטבני				
), LOW	ים חטור אוטרים) LOW	וב חטור				
	\forall	2	حَ		$ \forall$	~	5			

BIT MAP PATTERN ARRANGEMENT

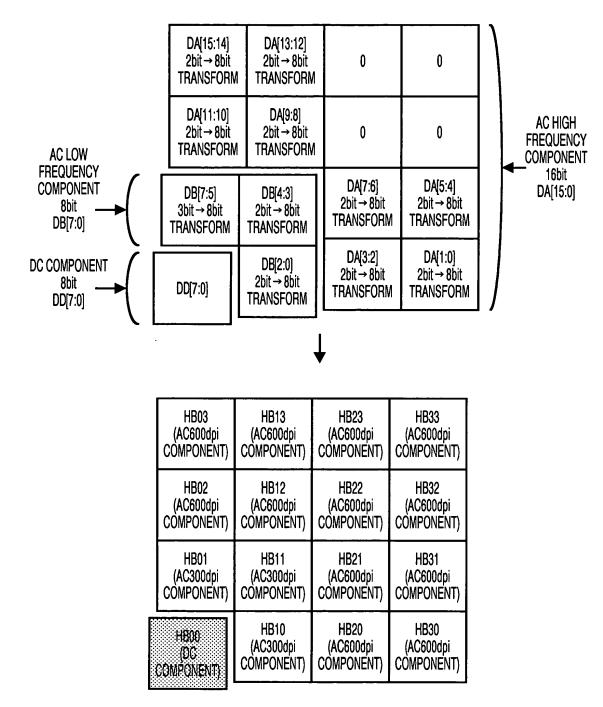
FIG. 7



ACTUAL BIT MAP DATA SUBJECTED TO FREQUENCY BANDING

FIG. 8

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INVERSE QUANTIZATION PROCESSING

FIG. 9

PAGE MEMORY WRITE ORDER

E00	E10	E20	E30
F	F	F	F
E01	E11	E21	E31
F	F	F	F
E02	E12	E22	E32
F	F	F	F
E03	E13	E23	E33
F	F	F	F
E04	E14	E24	E34
F	F	F	F

PAGE MEMORY READ ORDER $F_{x,y}[31:0]=E_{3-y,x}[31:0]$

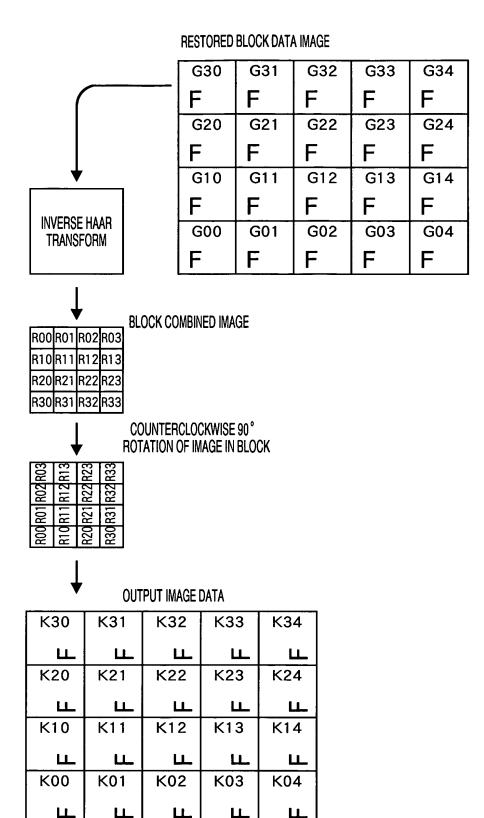
COUNTERCLOCKWISE 90 ROTATION

E30	E31	E32	E33	E34
F	F	F	F	F
E20	E21	E22	E23	E24
F	F	F	F	F
E10	E11	E12	E13	E14
F	F	F	F	F
E00	E01	E02	E03	E04
F	F	F	F	F

NOTE) F IS INDICATIVE OF DIRECTION OF IMAGE IN BLOCK

BLOCK ROTATION EDITING PROCESSING

FIG. 11



ROTATION PROCESSING OF IMAGE IN BLOCK

FIG. 12

Ea00	Ea10	Ea20	Ea30
F	F	F	F
Ea01	Ea11	Ea21	Ea31
F	F	F	F
Ea02	Ea12	Ea22	Ea32
F	F	F	F
Ea03	Ea13	Ea23	Ea33
F	F	F	F
Ea04	Ea14	Ea24	Ea34
F	F	F	F

Eb00	Eb10	Eb20	Eb30
F	F	F	F
Eb01	Eb11	Eb21	Eb31
F	F	F	F
Eb02	Eb12	Eb22	Eb32
F	F	F	F
F Eb03	F Eb13	F Eb23	F Eb33
	•	-	<u> </u>
Eb03	Eb13	Eb23	Eb33

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Ea00	Ea10	Ea20	Ea30	Eb00	Eb10	Eb20	Eb30
F	F	F	F	F	F	F	F
Ea01	Ea11	Ea21	Ea31	Eb01	Eb11	Eb21	Eb31
F	F	F	F	F	F	F	F
Ea02	Ea ₁₂	Ea22	Ea32	Eb02	Eb12	Eb22	Eb32
F	F	F	F	F	F	F	F
Ea03	Ea13	Ea23	Ea33	Eb03	Eb13	Eb23	Eb33
F	F	F	F	F	F	F	F
Ea04	Ea14	Ea24	Ea34	Eb04	Eb14	Eb24	Eb34
F	F	F	F	F	F	F	F

IMAGE COMBINING EDITING PROCESSING

FIG. 13

DECODING SECTION STORING MEMORY SODING 98 98 301 HEADER ADDING NFORMATION ROTATION SECTION <u>ද</u> ව 6/8/ 100 ROTATION INFORMATION HEADER DETECTING SECTION 107 302) FREQUENCY BANDING SECTION SECOND LINE MEMORY 733.0 32bit 32bit BLOCK DATA RESTORING 202 SECTION 201 G[31:0] 32bit 113 FREQUENCY DATA RESTORING SECTION **BLOCK DATA GENERATING SECTION** AC HIGH FREQUENCY
COMPONENT
QA[15:0]
16bit AC HIGH FREQUENCY
COMPONENT
DA(15:0)
16bit AC LOW FREQUENCY AC LOW FREQUENCY COMPONENT COMPONENT COMPONENT QD[7:0] 8bit DC COMPONENT 087.3 199.3 0:2]00 Q8[7:0] 8bit **OUANTIZING SECTION** INVERSE QUANTIZING SECTION OEFFICIENT HB00[7:0] HB33[7:0] HAAR COEFFICIENT HAD0[7:0] <u>†</u> 5 HA33[7:0] 16 × 8bit SECTION HAAR TRANSFORM SECTION MAORNART RAAH BERBYNI BLOCK DATA DD0[7:0] 033[7:0] 16 × 8bit BLOCK DATA PC0[7:0] R33[7:0] 16 × 8bit 5 <u>ද</u> සි COMBINING ROTATING BLOCK T MEMORY 4x4Dix SECTION FOURTH LINE MEMORY **BLOCK** 101 116 CONTROL DATA INPUT FOR IMAGE ROTATION 意 嵩

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